Journal of MOLECULAR BIOLOGY

EDITOR-IN-CHIEF
J. C. KENDREW

ASSISTANT EDITOR
S. BRENNER

EDITORIAL BOARD
R. L. Baldwin
M. S. Bretscher
C. R. Cantor
J. Davies
W. F. Dove
G. A. Gilbert
M. Gottesman
R. Huber
A. Klug
D. E. Koshland
S. Lowey
V. Luzzati
M. F. Moody
D. Nathans
C. C. Richardson
P. M. B. Walker
J. C. Wang
K. Weber
S. M. Weissman

VOLUME 113
15 June to 15 July 1977

ACADEMIC PRESS
London New York San Francisco

Copyright © 1977, by Academic Press Inc. (London) Ltd.

ALL RIGHTS RESERVED

No part of this volume may be reproduced in any form, by photostat, microfilm, or any other means, without written permission from the publishers.

Printed in Great Britain

CONTENTS OF VOLUME 113

Number 1, 15 June 1977

Saito, H. and Uchida, H., Initiation of the DNA Replication of Bacteriophage Lambda in *Escherichia coli* K12 1

Gillen, J. R., Karu, A. E., Nagaishi, H. and Clark, A. J., Characterization of the Deoxyribonuclease Determined by Lambda Reverse as Exonuclease VIII of *Escherichia coli* 27

Henderson, D. and Weil, J., Morphogenesis of Bacteriophage Lambda Deletion Mutants. I. Abnormal Head-related Structures Produced in Normal *Escherichia coli* 43

Henderson, D. and Weil, J., Morphogenesis of Bacteriophage Lambda Deletion Mutants. II. *Escherichia coli* Mutants which Prevent Maturation of Short Genomes 67

Veatch, W. and Stryer, L., The Dimeric Nature of the Gramicidin A Transmembrane Channel: Conductance and Fluorescence Energy Transfer Studies of Hybrid Channels 89

Changchien, L-M. and Craven, G. R., Proximity Relationships among the 30 S Ribosomal Proteins during Assembly *in vitro* 103

Driedonks, R. A., Krijgsman, P. C. J. and Mellema, J. E., Alfalfa Mosaic Virus Protein Polymerization 123

Zappe, H. A., Krohne-Ehrich, G. and Schulz, G. E., Low Resolution Structure of Human Erythrocyte Glutathione Reductase 141

Rose, G. D. and Seltzer, J. P., A New Algorithm for Finding the Peptide Chain Turns in a Globular Protein 153

Beemon, K. and Keith, J., Localization of N^6-Methyladenosine in the Rous Sarcoma Virus Genome 165

Fornili, S. L. and Fox, M. S., Electron Microscope Visualization of the Products of *Bacillus subtilis* Transformation 181

Lohrmann, R. and Orgel, L. E., Reactions of Adenosine 5′-phosphorimidazolide with Adenosine Analogs on a Polyuridylic Acid Template. The Uniqueness of the 2′-3′-Unsubstituted β-Ribosyl System 193

Pepe, F. A. and Dowben, P., The Myosin Filament. V. Intermediate Voltage Electron Microscopy and Optical Diffraction Studies of the Substructure 199

Sawicki, S. G., Jelinek, W. and Darnell, J. E., 3′-Terminal Addition to HeLa Cell Nuclear and Cytoplasmic Poly(A) 219

Rigby, P. W. J., Dieckmann, M., Rhodes, C. and Berg, P., Labeling Deoxyribonucleic Acid to High Specific Activity *in vitro* by Nick Translation with DNA Polymerase I 237

Leon, V., Altman, S. and Crothers, D. M., Influence of the A15 Mutation on the Conformational Energy Balance in *Escherichia coli* $tRNA^{Tyr}$ . . 253

Letter to the Editor

Comer, M. M., Correlation between Genetic and Nucleotide Distances in a Bacteriophage T4 Transfer RNA Gene 267

Announcement 273

Number 2, 25 June 1977

Creighton, T. E., Conformational Restrictions on the Pathway of Folding and Unfolding of the Pancreatic Trypsin Inhibitor 275

Creighton, T. E., Energetics of Folding and Unfolding of Pancreatic Trypsin Inhibitor 295

Creighton, T. E., Effects of Urea and Guanidine·HCl on the Folding and Unfolding of Pancreatic Trypsin Inhibitor 313

Creighton, T. E., Kinetics of Refolding of Reduced Ribonuclease . . . 329

Trinick, J. and Lowey, S., M-Protein from Chicken Pectoralis Muscle: Isolation and Characterization 343

Downie, J. A., Stewart, J. W., Brockman, N., Schweingruber, A. M. and Sherman, F., Structural Gene for Yeast Iso-2-cytochrome *c* 369

Engler, J. and Inman, R. B., Site-specific Recombination in Bacteriophage Lambda 385

Sternberg, M. J. E. and Thornton, J. M., On the Conformation of Proteins: Towards the Prediction of Strand Arrangements in β-Pleated Sheets . 401

Seybert, D. W. and Moffat, K., Structure of Hemoglobin Reconstituted with Mesoheme 419

Kratky, C. and Dunitz, J. D., Ordered Aggregation States of Chlorophyll a and Some Derivatives 431

Letters to the Editor

Chirgadze, Y. N., Garber, M. B. and Nikonov, S. V., Crystallographic Study of Plastocyanins 443

Parry, D. A. D., Crewther, W. G., Fraser, R. D. B. and MacRae, T. P., Structure of α-Keratin: Structural Implication of the Amino Acid Sequences of the Type I and Type II Chain Segments . . . 449

NUMBER 3, 5 JULY 1977

BARTH, P. T. and GRINTER, N. J., Map of Plasmid PR4 Derived by Insertion of Transposon C 455

AKHVERDYAN, V. Z., KISSELEV, L. L., KNORRE, D. G., LAVRIK, O. I. and NEVINSKY, G. A., Affinity Labelling of Tryptophanyl-Transfer RNA Synthetase 475

SHENK, T., A Biochemical Method for Increasing the Size of Deletion Mutations in Simian Virus 40 DNA 503

CHAPMAN, D., CORNELL, B. A., ELIASZ, A. W. and PERRY, A., Interactions of Helical Polypeptide Segments which Span the Hydrocarbon Region of Lipid Bilayers. Studies of the Gramicidin A–Lipid–Water Systems . 517

COTMORE, S. F., FURTHMAYR, H. and MARCHESI, V. T., Immunochemical Evidence for the Transmembrane Orientation of Glycophorin A. Location of Ferritin–Antibody Conjugates in Intact Cells 539

SARMA, R. and BOTT, R., Crystallographic Study of Turkey Egg-white Lysozyme and its Complex with a Disaccharide 555

LETTERS TO THE EDITOR

TIKHOMIROVA, L. P., VOROZHEIKINA, D. P., PUTINTCEVA, N. I. and MATVIENKO, N. I., Lambda and T4 Bacteriophage Hybrids . . 567

BARDSLEY, W. G., The Relationship between Co-operativity Coefficients, Factorability of the Allosteric Binding Polynomial and Curve Shape . 573

NUMBER 4, 15 JULY 1977

BROKER, T. R., SOLL, L. and CHOW, L. T., Underwound Loops in Self-renatured DNA can be Diagnostic of Inverted Duplications and Translocated Sequences 579

CHOW, L. T., KAHMANN, R. and KAMP, D., Electron Microscopic Characterization of DNAs of Non-defective Deletion Mutants of Bacteriophage Mu . 591

CHOW, L. T., Sequence Arrangements of the *Escherichia coli* Chromosome and of Putative Insertion Sequences, as Revealed by Electron Microscopic Heteroduplex Studies 611

HOCHKEPPEL, H.-K. and CRAVEN, G. R., Significant Changes in 16 S RNA Conformation Accompanying Assembly of the 30 S Ribosome *in vitro* . 623

FUJIWARA, Y., TATSUMI, M. and SASAKI, M. S., Cross-link Repair in Human Cells and its Possible Defect in Fanconi's Anemia Cells 635

RAY, D. S. and DUEBER, J., Location of the Origin-terminus of the Viral Strand of the Duplex Replicative Form of Bacteriophage G4 DNA . 651

Yanofsky, C. and Soll, L., Mutations Affecting $tRNA^{Trp}$ and its Charging and Their Effect on Regulation of Transcription Termination at the Attenuator of the Tryptophan Operon 663

DeRosier, D., Mandelkow, E., Silliman, A., Tilney, L. and Kane, R., Structure of Actin-containing Filaments from Two Types of Non-muscle Cells 679

Deslauriers, R., Ralston, E. and Somorjai, R. L., Conformational Studies on Angiotensin-II. Least-squares Fit of Carbon-13 Nuclear Magnetic Resonance Relaxation Times to Extended and Folded Conformations . 697

Letter to the Editor

Novotný, J., Vítek, A. and Franěk, F., Analysis of Interspecies Variability of Immunoglobulin Lambda Chains Reveals Differences in Domain Tertiary Structures 711

Index to Volume 113

A15 mutation, influence on the conformational energy balance in *Escherichia coli* $tRNA^{Tyr}$, 253
Actin-containing filament structure for two types of non-muscle cells, 679
Adenosine 5′-phosphorimidazolide, reactions with adenosine analogs on a polyuridylic acid template; the uniqueness of the 2′-3′-unsubstitued β-ribosyl system, 193
Affinity labelling of tryptophanyl-tRNA synthetase, 475
Aggregation states, ordered, of chlorophyll a and some derivatives, 431
Akhverdyan, V. Z., Kisselev, L. L., Knorre, D. G., Lavrik, O. I. & Nevinsky, G. A., Affinity labelling of tryptophanyl-tRNA synthetase, 475
Alfalfa mosaic virus protein polymerization, 123
Algorithm, new, for finding the peptide chain turns in a globular protein, 153
Allosteric binding polynomial factorability, curve shape, and co-operativity coefficients, the relationships between them, 573
Altman, S. (see also Leon, V.), 253
Angiotensin-II conformational studies. Least-squares fit of carbon-13 n.m.r. relaxation times to extended and folded conformations, 697
Antibody–ferritin conjugates, localization in intact cells; immunochemical evidence for the transmembrane orientation of glycophorin A, 539
Assembly of the 30 S ribosome *in vitro* is accompanied by significant changes in 16 S RNA conformation, 623

β-pleated sheets in globular proteins, towards the prediction of their strand arrangements, 401
Bacillus subtilis, electron microscope visualization of the transformation products, 181
Bacteriophage G4 DNA, location of the origin-terminus of the viral strand of the duplex replicative form, 651
— lambda deletion mutant morphogenesis. Abnormal head-related structures produced in normal *Escherichia coli*, 43
— — — — —, *Escherichia coli* mutants which prevent maturation of short genomes, 67
— —, initiation of DNA replication in *Escherichia coli* K12, 1
— — site-specific recombination, 385
— — and T4 hybrids, 567
— Mu, electron microscopic characterization of DNAs of non-defective deletion mutants, 591
— T4, correlation between genetic and nucleotide distances in rRNA gene, 267
Bardsley, W. G., The relationship between co-operativity coefficients, factorability of the allosteric binding polynomial and curve shape, 573
Barth, P. T. & Grinter, N. J., Map of plasmid PR4 derived by insertion of transposon C, 455
Beemon, K. & Keith, J., Localization of N^6-methyladenosine in the Rous sarcoma virus genome, 165
Berg, P. (see also Rigby, P. W. J.), 237
Binding, allosteric, the relationship between co-operativity coefficients, factorability of the binding polynomial and curve shape, 573
Bott, R. (see also Sarma, R.), 555
Brockman, N. (see also Downie, J. A.), 369
Broker, Y. R., Soll, L. & Chow, L. T., Underwound loops in self-renatured DNA can be diagnostic of inverted duplications and translocated sequences, 579

Carbon-13 n.m.r. relaxation times, least-squares fit to extended and folded conformations of angiotensin-II, 697
Chain turns of peptides in a globular protein, a new algorithm for their identification, 153
Chains, lambda, of immunoglobulin, analysis of interspecies variability reveals differences in domain tertiary structures, 711
Changchien, L-M. & Craven, G. R., Proximity relationships among the 30 S ribosomal proteins during assembly *in vitro*, 103
Channels, transmembrane, formed by gramicidin A, dimeric nature; conductance and fluorescence energy transfer studies of hybrid channels, 89

Chapman, D., Cornell, B. A., Eliasz, A. W. & Perry, A., Interactions of helical polypeptide segments which span the hydrocarbon region of lipid bilayers. Studies of the gramicidin A–lipid–water systems, 517
Chicken pectoralis muscle M-protein: isolation and characterization, 343
Chirgadze, Y. N., Garber, M. B. & Nikonov, S. V., Crystallographic study of plastocyanins, 443
Chlorophyll a and some derivatives, ordered aggregation states, 431
Chow, L. T., Sequence arrangements of the *Escherichia coli* chromosome and of putative insertion sequences, as revealed by electron microscopic heteroduplex studies, 611
—, Kahmann, R. & Kamp, D., Electron microscopic characterization of DNAs of non-defective deletion mutants of bacteriophage Mu, 591
— (see also Broker, T. R.), 579
Chromosome of *Escherichia coli*, arrangements of sequence and of putative insertion sequences, as revealed by electron microscopic heteroduplex studies, 611
Clark, A. J. (see also Gillen, J. R.), 27
Comer, M. M., Correlation between genetic and nucleotide distances in a bacteriophage T4 transfer RNA gene, 267
Conformation of proteins: towards the prediction of strand arrangements in β-pleated sheets, 401
— — 16 S RNA changes significantly during assembly of the 30 S ribosome *in vitro*, 623
Conformational energy balance in *Escherichia coli* $tRNA^{Tyr}$, influence of the A15 mutation, 253
— restrictions on the pathway of folding and unfolding of the pancreatic trypsin inhibitor, 275
— studies on angiotensin-II. Least-squares fit of carbon-13 n.m.r. relaxation times to extended and folded conformations, 697
Co-operativity coefficients, their relationship to factorability of the allosteric binding polynomial and curve shape, 573
Cornell, B. A. (see also Chapman, D.), 517
Cotmore, S. F., Furthmayr, H. & Marchesi, V. T., Immunochemical evidence for the transmembrane orientation of glycophorin A. Location of ferritin–antibody conjugates in intact cells, 539
Craven, G. R. (see also Changchien, L-M.), 103
— (see also Hochkeppel, H.-K.), 623
Creighton, T. E., Conformational restrictions on the pathway of folding and unfolding of the pancreatic trypsin inhibitor, 275
—, Effects of urea and guanidine·HCl on the folding and unfolding of pancreatic trypsin inhibitor, 313
—, Energetics of folding and unfolding of pancreatic trypsin inhibitor, 295
—, Kinetics of refolding of reduced ribonuclease, 329
Crewther, W. G. (see also Parry, D. A. D.), 449
Cross-link repair in human cells and its possible defect in Fanconi's anemia cells, 635
Crothers, D. M. (see also Leon, V.), 253
Crystallographic study of plastocyanins, 443
— — — turkey egg-white lysozyme and its complex with a disaccharide, 555
Cytoplasmic and nuclear poly(A) of HeLa cells, 3′-terminal addition, 219

Darnell, J. E. (see also Sawicki, S. G.), 219
Deletion mutants, non-defective, of bacteriophage Mu, electron microscopic characterization of DNAs, 591
— mutations in Simian virus 40, a biochemical method for increasing their size, 503
Deoxyribonuclease of *Escherichia coli* determined by lambda reverse; comparison with exonuclease VIII, 27
— of bacteriophage G4, location of the origin-terminus of the viral strand of the duplex replicative form, 651
— of *Escherichia coli*, studies of inverted duplications, 611
— labeled to high specific activity *in vitro* by nick translation with DNA polymerase I, 237
DNA replication of bacteriophage lambda, initiation in *Escherichia coli* K12, 1
—, self-renatured, underwound loops can be diagnostic of inverted duplications and translocated sequences, 579
— of Simian virus 40, a biochemical method for increasing the size of deletion mutations, 503
DNAs of non-defective deletion mutants of bacteriophage Mu, electron microscopic characterization, 591
DeRosier, D., Mandelkow, E., Silliman, A., Tilney, L. & Kane, R., Structure of actin-containing filaments from two types of non-muscle cells, 679

Deslauriers, R., Ralston, E. & Somorjai, R. L., Conformational studies on angiotensin. II. Least-squares fit of carbon-13 n.m.r. relaxation times to extended and folded conformations, 697
Diagnosis of inverted DNA duplications and translocated sequences, 579
Dieckmann, M. (see also Rigby, P. W. J.), 237
Disaccharide binding and turkey egg-white lysozyme, a crystallographic study, 555
Domain tertiary structure differences revealed by analysis of interspecies variability of immunoglobulin lambda chains, 711
Dowben, P. (see also Pepe, F. A.), 199
Downie, J. A., Stewart, J. W., Brockman, N., Schweingruber, A. M. & Sherman, F., Structural gene for yeast iso-2-cytochrome *c*, 369
Driedonks, R. A., Krijgsman, P. C. J. & Mellema, J. E., Alfalfa mosaic virus protein polymerization, 123
Dueber, J. (see also Ray, D. S.), 651
Dunitz, J. D. (see also Kratky, C.), 431
Duplex replicative form of bacteriophage G4 DNA, location of the origin-terminus of the viral strand, 651
Duplications, inverted, and translocated sequences can be diagnosed by underwound loops in self-renatured DNA, 579
—, —, in *Escherichia coli* DNA, 611

Egg-white lysozyme, turkey, and its complex with a disaccharide, a crystallographic study, 555
Electron microscope visualization of the products of *Bacillus subtilis* transformation, 181
— microscopic characterization of DNAs of non-defective deletion mutants of bacteriophage Mu, 591
— — heteroduplex studies of sequence arrangements of the *Escherichia coli* chromosome and of putative insertion sequences, 611
— microscopy, intermediate voltage, and optical diffraction studies of the myosin filament substructure, 199
Eliasz, A. W. (see also Chapman, D.), 517
Engler, J. & Inman, R. B., Site-specific recombination in bacteriophage lambda, 385
Erythrocyte glutathione reductase, human, low resolution structure, 141
Escherichia coli, characterization of the deoxyribonuclease determined by lambda reverse as exonuclease VIII, 27
— — chromosome, arrangements of sequence and of putative insertion sequences, as revealed by electron microscopic heteroduplex studies, 611
— — K12, initiation of the DNA replication of bacteriophage lambda, 1
— — mutants which prevent maturation of short genomes; morphogenesis of bacteriophage lambda deletion mutants, 67
— —, normal, and the production of abnormal heads from lambda deletion mutants, 43
— — $tRNA^{Tyr}$, influence of the A15 mutation on the conformational energy balance, 253
Exonuclease VIII of *Escherichia coli*, comparison with the deoxyribonuclease determined by lambda reverse, 27

Fanconi's anemia cells, possible defect of cross-link repair; cross-link repair in human cells, 635
Ferritin–antibody conjugates, localization in intact cells; immunochemical evidence for the transmembrane orientation of glycophorin A, 539
Filament, actin-containing, structure for two types of non-muscle cells, 679
Filaments of myosin, intermediate voltage electron microscopy and optical diffraction studies of the substructure, 199
Folding and unfolding of the pancreatic trypsin inhibitor, conformational restrictions on the pathway, 275
— — — — — — — —, effects of urea and guanidine·HCl, 313
— — — — — — — —, energetics, 295
Fornili, S. L. & Fox, M. S., Electron microscope visualization of the products of *Bacillus subtilis* transformation, 181
Fox, M. S. (see also Fornili, S. L.), 181
Franěk, F. (see also Novotný, J.), 711
Fraser, R. D. B. (see also Parry, D. A. D.), 449
Fujiwara, Y., Tatsumi, M. Sasaki, M. S., Cross-link repair in human cells and its possible defect in Fanconi's anemia cells, 635
Furthmayr, H. (see also Cotmore, S. F.), 539

G4 (see also Bacteriophage), 651
Garber, M. B. (see also Chirgadze, Y. N), 443
Gene, structural, for yeast iso-2-cytochrome *c*, 369
— for bacteriophage T4 tRNA, correlation between genetic and nucleotide distances, 267
Genome of Rous sarcoma virus, localization of N^6-methyladenosine, 165
—, short, maturation prevented by *Escherichia coli* mutants; morphogenesis of bacteriophage lambda deletion mutants, 67
Gillen, J. R., Karu, A. E., Nagaishi, H. & Clark, A. J., Characterization of the deoxyribonuclease determined by lambda reverse as exonuclease VIII of *Escherichia coli*, 27
Globular protein, a new algorithm for finding the peptide chain turns, 153
Glutathione reductase from human erythrocytes, low resolution structure, 141
Glycophorin A, immunochemical evidence for the transmembrane orientation. Localization of ferritin–antibody conjugates in intact cells, 539
Gramicidin A–lipid–water system. Interactions of helical polypeptide segments which span the hydrocarbon region of lipid bilayers, 517
— — transmembrane channel, dimeric nature; conductance and fluorescence energy transfer studies of hybrid channels, 89
Grinter, N. J. (see also Barth, P. T.), 455
Guanidine·HCl and urea, their effects on the folding and unfolding of pancreatic trypsin inhibitor, 313

Heads, abnormal, from lambda deletion mutants produced in normal *Escherichia coli*, 43
HeLa cell nuclear and cytoplasmic poly(A), 3′-terminal addition, 219
Helical polypeptide segments which span the hydrocarbon region of lipid bilayers, their interactions. Studies of the gramicidin A–lipid–water system, 517
Hemoglobin reconstituted with mesoheme, structure, 419
Henderson, D. & Weil, J., Morphogenesis of bacteriophage lambda deletion mutants. I. Abnormal head-related structures produced in normal *Escherichia coli*, 43
— & —, — — — — — — —. II. *Escherichia coli* mutants which prevent maturation of short genomes, 67
Hochkeppel, H.-K. & Craven, G. R., Significant changes in 16 S RNA conformation accompanying assembly of the 30 S ribosome *in vitro*, 623
Human cell cross-link repair and its possible defect in Fanconi's anemia cells, 635
— erythrocyte glutathione reductase, low resolution structure, 141
Hybrid lambda and T4 bacteriophages, 567

Immunoglobulin lambda chains, analysis of interspecies variability reveals differences in domain tertiary structures, 711
Inman, R. B. (see also Engler, J.), 385
Iso-2-cytochrome *c* of yeast, structural gene, 369

Jelinek, W. (see also Sawicki, S. G.), 219

Kahmann, R. (see also Chow, L. T.), 591
Kamp, D. (see also Chow, L. T.), 591
Kane, R. (see also DeRosier, D.), 679
Karu, A. E. (see also Gillen, J. R.), 27
Keith, J. (see also Beemon, K.), 165
α-Keratin structure: structural implications of the amino acid sequences of the type I and type II chain segments, 449
Kisselev, L. L. (see also Akhverdyan, V. Z.), 475
Knorre, D. G. (see also Akhverdyan, V. Z.), 475
Kratky, C. & Dunitz, J. D., Ordered aggregation states of chlorophyll a and some derivatives, 431
Krijgsman, P. C. J. (see also Driedonks, R. A.), 123
Krohne-Ehrich, G. (see also Zappe, H. A.), 141

λ (see also Bacteriophage), 1, 43, 67, 385, 567
— chains of immunoglobulin, analysis of interspecies variability reveals differences in domain tertiary structures, 711

— reverse deoxyribonuclease of *Escherichia coli*, comparison with exonuclease VIII, 27
Labeling DNA to high specific activity *in vitro* by nick translation with DNA polymerase I, 237
Lavrik, O. I. (see also Akhverdyan, V. Z.), 475
Leon, V., Altman, S. & Crothers, D. M., Influence of the A15 mutation on the conformational energy balance in *Escherichia coli* $tRNA^{Tyr}$, 253
Lipid–water system for gramicidin A. Interactions of helical polypeptide segments which span the hydrocarbon region of lipid bilayers, 517
Lohrmann, R. & Orgel, L. E., Reactions of adenosine 5′-phosphorimidazolide with adenosine analogs on a polyuridylic acid template. The uniqueness of the 2′-3′-unsubstituted β-ribosyl system, 193
Loops, underwound, in self-renatured DNA can be diagnostic of inverted duplications and translocated sequences, 579
Lowey, S. (see also Trinick, J.), 343
Lysozyme of turkey egg-white and its complex with a disaccharide, a crystallographic study, 555

MacRae, T. P. (see also Parry, D. A. D.), 449
Mandelkow, E. (see also DeRosier, D.), 679
Map of plasmid RP4 derived by insertion of transponson C, 455
Marchesi, V. T. (see also Cotmore, S. F.), 539
Matvienko, N. I. (see also Tikhomirova, L. P.), 567
Mellema, J. E. (see also Driedonks, R. A.), 123
Mesoheme-reconstituted hemoglobin, structure, 419
Moffat, K. (see also Seybert, D. W.), 419
Morphogenesis of bacteriophage lambda deletion mutants. Abnormal head-related structure produced in normal *Escherichia coli*, 43
— — — — — —. *Escherichia coli* mutants which prevent maturation of short genomes, 67
M-protein from chicken pectoralis muscle: isolation and characterization, 343
Mu (see also Bacteriophage), 591
Muscle, pectoralis, of chicken, isolation and characterization of M-protein, 343
Mutants, deletion, of bacteriophage lambda; abnormal head-related structures produced in normal *Escherichia coli*, 43
—, —, — — —; *Escherichia coli* mutants which prevent maturation of short genomes, 67
—, —, non-defective, of bacteriophage Mu, electron microscopic characterization of DNAs, 591
Mutation A15, influence on the conformational energy balance in *Escherichia coli* $tRNA^{Tyr}$, 253
Mutations affecting $tRNA^{Tyr}$ and its charging, and their effect on regulation of transcription termination at the attenuator of the tryptophan operon, 663
—, deletion, in Simian virus 40, a biochemical method for increasing their size, 503
Myosin filament substructure, intermediate voltage electron microscopy and optical diffraction studies, 199

Nagaishi, H. (see also Gillen, J. R.), 27
Nevinsky, G. A. (see also Akhverdyan, V. Z.), 475
Nick translation with DNA polymerase I used to label DNA to high specific activity *in vitro*, 237
Nikonov, S. V. (see also Chirgadze, Y. N.), 443
N^6-methyladenosine, localization in the Rous sarcoma virus genome, 165
Novotný, J., Vítek, A. & Franěk, F., Analysis of interspecies variability of immunoglobulin lambda chains reveals differences in domain tertiary structures, 711
Nuclear and cytoplasmic poly(A) of HeLa cells, 3′-terminal addition, 219
— magnetic resonance carbon-13 relaxation times least-squares fit to extended and folded conformations, for angiotensin-II, 697
Nucleotide distances, correlation with genetic distances in a bacteriophage T4 tRNA gene, 267

Orgel, L. E. (see also Lohrmann, R.), 193
Origin-terminus location of the viral strand of the duplex replicative form of bacteriophage G4 DNA, 651

Pancreatic trypsin inhibitor, conformational restrictions on the pathway of folding and unfolding, 275
— — —, effects of urea and guanidine·HCl on folding and unfolding, 313

— — —, energetics of folding and unfolding, 295
Parry, D. A. D., Crewther, W. G., Fraser, R. D. B. & MacRae, T. P., Structure of α-keratin: structural implication of the amino acid sequences of the type I and type II chain segments, 449
Pepe, F. A. & Dowben, P., The myosin filament. V. Intermediate voltage electron microscopy and optical diffraction studies of the substructure, 199
Peptide chain turns in a globular protein, a new algorithm for their identification, 153
Perry, A. (see also Chapman, D.), 517
Plasmid RP4 map derived by insertion of transposon C, 455
Plastocyanins, a crystallographic study, 443
Poly(A), nuclear and cytoplasmic, of HeLa cells, 3′-terminal addition, 219
Polymerase I for DNA used to label DNA to high specific activity *in vitro* by nick translation, 237
Polymerization of alfalfa mosaic virus protein, 123
Polypeptide segments, helical, which span the hydrocarbon region of lipid bilayers, their interactions. Studies of the gramicidin A–lipid–water system, 517
Polyuridylic acid template reactions of adenosine 5′-phosphorimidazolide with adenosine analogs: the uniqueness of the 2′-3′-unsubstituted β-ribosyl system, 193
Protein conformation: towards the prediction of strand arrangements in β-pleated sheets, 401
—, globular, a new algorithm for finding the peptide chain turns, 153
—, M-, from chicken pectoralis muscle: isolation and characterization, 343
— polymerization for alfalfa mosaic virus, 123
Proteins, 30 S ribosomal, proximity relationships during assembly *in vitro*, 103
Proximity relationships among the 30 S ribosomal proteins during assembly *in vitro*, 103
Putintceva, N. I. (see also Tikhomirova, L. P.), 567

Ralston, E. (see also Deslauriers, R.), 697
Ray, D. S. & Dueber, J., Location of the origin-terminus of the viral strand of the duplex replicative form of bacteriophage G4 DNA, 651
Recombination, site-specific, in bacteriophage lambda, 385
Refolding kinetics of reduced ribonuclease, 329
Replication of DNA of bacteriophage lambda in *Escherichia coli* K12, initiation, 1
Rhodes, C. (see also Rigby, P. W. J.), 237
Ribonuclease, reduced, kinetics of refolding, 329
RNA, influence of the A15 mutation on the conformational energy balance in *Escherichia coli* $tRNA^{Tyr}$, 253
—, mutations affecting $tRNA^{Tyr}$ and its charging and their effect on regulation of transcription termination at the attenuator of the trypotophan operon, 663
— 16 S conformation changes significantly during assembly of the 30 S ribosome *in vitro*, 623
—, transfer, gene of bacteriophage T4, correlation between genetic and nucleotide distances, 267
Ribosomal 30 S proteins, proximity relationships during assembly *in vitro*, 103
Ribosome 30 S assembly *in vitro* is accompanied by significant changes in 16 S RNA conformation, 623
β-Ribosyl, 2′-3′-unsubstituted, system, its uniqueness; reactions of adenosine 5′-phosphorimidazolide with adenosine analogs on a polyuridylic acid template, 193
Rigby, P. W. J., Dieckmann, M., Rhodes, C. & Berg, P., Labelling deoxyribonucleic acid to high specific activity *in vitro* by nick translation with DNA polymerase I, 237
Rose, G. D. & Seltzer, J. P., A new algorithm for finding the peptide chain turns in a globular protein, 153
Rous sarcoma virus genome, localization of N^6-methyladenosine, 165
RP4 plasmid map derived by insertion of transposon C, 455

Saito, H. & Uchida, H., Initiation of the DNA replication of bacteriophage lambda in *Escherichia coli* K12, 1
Sarma, R. & Bott, R., Crystallographic study of turkey egg-white lysozyme and its complex with a disaccharide, 555
Sasaki, M. S. (see also Fujiwara, Y.), 635
Sawicki, S. G., Jelinek, W. & Darnell, J. E., 3′-Terminal addition to HeLa cell and cytoplasmic poly(A), 219
Schulz, G. E. (see also Zappe, H. A.), 141
Schweingruber, A. M. (see also Downie, J. A.), 369
Seltzer, J. P. (see also Rose, G. D.), 153

Sequence arrangements of the *Escherichia coli* chromosome and of putative insertion sequences, as revealed by electron microscopic heteroduplex studies, 611
Sequences, amino acid, of the type I and type II chain segments for α-keratin, their structural implications, 449
—, translocated, and inverted duplications can be diagnosed by underwound loops in self-renatured DNA, 579
Seybert, D. W. & Moffat, K., Structure of hemoglobin reconstituted with mesoheme, 419
Sheets, β-pleated, in globular proteins, towards the prediction of their strand arrangements, 401
Shenk, T., A biochemical method for increasing the size of deletion mutations in Simian virus 40 DNA, 503
Sherman, F. (see also Downie, J. A.), 369
Silliman, A. (see also DeRosier, D.), 679
Simian virus 40 (see also Virus), 503
Soll, L. (see also Broker, T. R.), 579
—, L. (see also Yanofsky, C.), 663
Somorjai, R. L. (see also Deslauriers, R.), 697
Sternberg, M. J. E. & Thornton, J. M., On the conformation of proteins: towards the prediction of strand arrangements in β-pleated sheets, 401
Stewart, J. W. (see also Downie, J. A.), 369
Strand arrangements in β-pleated sheets in globular proteins, their prediction, 401
Structural gene for yeast iso-2-cytochrome *c*, 369
Structure of actin-containing filaments from two types of non-muscle cells, 679
— — hemoglobin reconstituted with mesoheme, 419
— — α-keratin: structural implication of the amino acid sequences of the type I and type II chain segments, 449
—, low resolution, of human erythrocyte glutathione reductase, 141
Structure of myosin filament, intermediate voltage electron microscopy and optical diffraction studies of the substructure, 199
—, tertiary, of domains, differences revealed by analysis of interspecies variability of immunoglobulin lambda chains, 711
Stryer, L. (see also Veatch, W.), 89

T4 (see also Bacteriophage), 267, 567
Tatsumi, M. (see also Fujiwara, Y.), 635
3′-Terminal addition to HeLa cell nuclear and cytoplasmic poly(A), 219
Thornton, J. M. (see also Sternberg, M. J. E.), 401
Tikhomirova, L. P., Vorozheikina, D. P., Putintceva, N. I. & Matvienko, N. I., Lambda and T4 bacteriophage hybrids, 567
Tilney, L. (see also DeRosier, D.), 679
Transcription termination regulation at the attenuator of the tryptophan operon, effect of mutations affecting $tRNA^{Trp}$ and its charging, 663
Transfer RNA gene of bacteriophage T4, correlation between genetic and nucleotide distances, 267
— RNA^{Tyr} of *Escherichia coli*, influence of the A15 mutation on the conformational energy balance, 253
— RNA^{Trp}, mutations affecting it and its charging and their effect on regulation of transcription termination at the attenuator of the tryptophan operon, 663
Translation, nick, with DNA polymerase, used to label DNA to high specific activity *in vitro*, 237
Transmembrane channels formed by gramicidin A, dimeric nature; conductance and fluorescence energy transfer studies of hybrid channels, 89
— orientation of glycophorin A, immunochemical evidence. Localization of ferritin–antibody conjugates in intact cells, 539
Transposon C insertion map of plasmid RP4, 455
Trinick, J. & Lowey, S., M-protein from chicken pectoralis muscle: isolation and characterization, 343
Trypsin inhibitor, pancreatic, conformational restrictions on the pathway of folding and unfolding, 275
— —, —, effects of urea and guanidine·HCl on folding and unfolding, 313
— —, —, energetics of folding and unfolding, 295
Tryptophan operon, mutations affecting $tRNA^{Trp}$ and its charging and their effect on regulation of transcription termination at the attenuator, 663
Tryptophanyl-tRNA synthetase, affinity labelling, 475
Turkey egg-white lysozyme and its complex with a disaccharide, a crystallographic study, 555

Uchida, A. (see also Saito, H.), 1
Urea and guanidine·HCl, their effects on the folding and unfolding of pancreatic trypsin inhibitor, 313

Veatch, W. & Stryer, L., The dimeric nature of the gramicidin A transmembrane channel: conductance and fluorescence energy transfer studies of hybrid channels, 89
Viral strand of the duplex replicative form of bacteriophage G4 DNA, location of the origin-terminus, 651
Virus, alfalfa mosaic, protein polymerization, 123
—, Rous sarcoma, localization of N^6-methyladenosine in the genome, 165
—, SV40, a biochemical method for increasing the size of deletion mutations in DNA, 503
Vítek, A. (see also Novotný, J.), 711
Vorozheikina, D. P. (see also Tikhomirova, L. P.), 567

Weil, J. (see also Henderson, D.), 43, 67

Yanofsky, C. & Soll, L., Mutations affecting $tRNA^{Trp}$ and its charging and their effect on regulation of transcription termination at the attenuator of the tryptophan operator, 663
Yeast iso-2-cytochrome *c* structural gene, 369

Zappe, H. A., Krohne-Ehrich, G. & Schulz, G. E., Low resolution structure of human erythrocyte glutathione reductase, 141